$$L=\frac{160}{2\pi}[2\pi\sqrt{1+4\pi^2}+\log(2\pi+\sqrt{1+4\pi^2})]=1082.56 \text{ feet.}$$

[No. 50, *Calculus.*]

The ratio of rates of extremity of the bridge and the man in his path is:

$$\frac{a}{2}\,d\theta \div dl=\frac{\pi n}{\sqrt{1+\theta^2}}.$$

The ratio of rates of extremity of bridge and the man's *walking* is:

$$\frac{\pi a n}{a}=\pi n.$$

Also solved by *G. B. M. ZERR* and *C. W. M. BLACK.*

PROBLEMS.

57. Proposed by F. M. McGAW. A. M., Mathematical Department, Bordentown Military Institute, Bordentown, New Jersey.

Solve the following equation: $(1+x^2)\frac{d^2y}{dx^2}-2x\frac{dy}{dx}+2y=0.$

58. Proposed by O. W. ANTHONY, M. Sc., Professor of Mathematics in New Windsor College, New Windsor, Maryland.

A line passes through a fixed point and rotates uniformly about this point. Another line passes through a point which moves uniformly along the arc of a given curve and rotates uniformly about this point. Develop a method for finding the locus of intersection of these two lines. Apply to case of circle and straight line.

MECHANICS.

Conducted by B. F. FINKEL, Springfield, Mo. All contributions to this department should be sent to him.

SOLUTIONS OF PROBLEMS.

32. Proposed by OTTO CLAYTON, A. B., Fowler, Indiana.

The wheel of a wind pump has 60 fans, each turned at an angle of 45° to the direction of the axis, and each having 150 square inches exposed to the wind. If the wind blows with a velocity of V and the wheel rotates with velocity ω, what is the component of force or pressure along the axis if it is turned at an angle α to the direction of the wind, assuming the resistance of the wheel in turning to be R?

No solution of this problem has been received.